

WHAT IS CLAIMED IS:

1. Apparatus for producing wire reinforcement cast members comprising:

5 a mold assembly having inner and outer walls forming a hollow space defining a member to be cast;

one of said inner and outer walls having elongated mounting openings;

10 at least one support member having a main body portion and integral mounting means inserted into said openings and moveable to a position occupying only a portion of the mounting openings when properly slidably inserted therein;

15 a wire reinforcement receiving portion in said main body portion for receiving and supporting a wire reinforcement;

at least a portion of said mounting means breaking away from the main body portion when  
20 said cast member is separated from the mold assembly; and

said mounting means including sealing flanges covering those portions of the mounting openings not occupied by said mounting means to  
25 prevent cast material inserted into the mold assembly from seepage therethrough.

2. The apparatus of claim 1 wherein said main body portion comprises a planar member  
30 having reinforcement flanges arranged along upper and lower edges thereof to respectively for a T-shaped configuration at said upper end and an inverted T-shaped cross-section along said lower end.

35

3. The apparatus of claim 1 wherein said support member wire holding portion comprises an opening near an end of said main body portion opposite the end of the main body portion to which  
5 said projection is joined, said opening communicating with an upper edge of said support member to facilitate insertion of a wire reinforcement into said opening.

10 4. The apparatus of claim 3 wherein said opening has overhanging projecting portions which extend over a portion of said opening, said overhanging projecting portions being integral with the upper flange of said main body portion.

15 5. The apparatus of claim 1 wherein said mounting means comprise a pair of L-shaped mounting flanges integrally joined to one end of said main body portion.

20 6. The apparatus of claim 2 wherein said one end of said main body portion is provided with an integral reinforcement flange forming a T-shaped cross-section with said main body portion.

25 7. The apparatus of claim 6 wherein said mounting means comprise L-shaped flanges integrally joined to said reinforcement flange.

30 8. The apparatus of claim 7 wherein said L-shaped mounting flanges each have a portion extending through openings in said one mold member which are of a thickness sufficient to prevent being broken during insertion of cast material and  
35 yet being thin enough to easily break away from the

main body portion when the cast member is separated from the said one mold member.

9. The apparatus of claim 1 wherein  
5 the main body portion is tapered from the mounting end to a free end thereof.

10. The apparatus of claim 8 wherein  
10 said mounting openings comprise a pair of slots each having first slot portions of a width sufficient to receive outer mounting flange portions of the L-shaped flanges, ends of each of  
15 said first slot portions communicating with second slot portions of reduced width, whereby, when the flanges of the support member are moved to slide into the second slot portions, the L-shaped flanges of the support member are secured to said one mold member, said sealing flanges covering said first  
20 slot portions when the mounting flange portions are inserted in said second slot portions.

11. The apparatus of claim 10 wherein  
said pair of slots are provided in a member which is  
mounted within an opening in said one mold member,  
25 said opening having a shape conforming to the perimeter of said member.

12. The support member of claim 1  
wherein said opening for receiving said wire  
30 reinforcement has an overhanging portion whereby when a wire reinforcement is pressed against a side wall of said opening, said wire reinforcement is positioned beneath said overhanging portion.

13. The apparatus of claim 1 wherein

said wire reinforcement opening comprises a substantially U-shaped holding member arranged near an end of said main body portion opposite said one end.

5

14. An apparatus for producing cast members having step inserts embedded therein comprising;

a mold assembly having inner and outer  
10 walls forming a hollow space defining a member to be cast;

one of said inner and outer walls having mounting openings;

at least one insert member having a body  
15 portion and integral mounting means inserted into said support openings and moveable to a position occupying only a portion of the mounting openings when properly slidably mounted therein;

at least a portion of said mounting  
20 means breaking away from the main body portion when said cast member is separated from the mold assembly;

said main body portion being hollow and open at one end for force-fittingly receiving and  
25 supporting a projection of a step member; and

said mounting means including sealing flanges covering those portions of the mounting openings not occupied by said mounting means to prevent cast material inserted into the mold  
30 assembly from seepage therethrough.

15. Apparatus for forming a cast body, including a mold assembly having inner and outer mold members defining a hollow mold space  
35 therebetween, wherein one wall of one of said mold

members is provided with elongated rectangular-shaped openings, each opening having a width along one portion thereof which is narrower than a width along a remaining portion for slidably receiving a  
 5 step insert member to be embedded into said cast body, said step insert member comprising:

a one-piece elongated hollow molded plastic body having a first open end and a second sealed end;

10 first and second pairs of resilient flanges integrally joined to said body adjacent said open end and extending in a direction perpendicular to a longitudinal axis of said body;

said first pair of flanges being  
 15 substantially coplanar and being spaced a predetermined distance inward from said first pair of flanges, said first and second pairs of flanges cooperating to embrace opposite surfaces of a marginal portion of said one mold member and  
 20 surrounding said openings to maintain the step insert member in proper alignment;

said second pair of flanges being  
 slidably inserted into the wider width portions of said openings and slidably moved into the narrower  
 25 width portions;

at least one flange of said first pair of flanges having a flange portion sealing said wider width portions of said openings when said first pair of flanges are positioned in said  
 30 narrower width portions to prevent seepage of cast material poured into said mold assembly.

16. The apparatus of claim 15 wherein at least a portion of said second pair of flanges  
 35 are broken away when the member cast in said mold

assembly is lifted out of the mold assembly.

17. The apparatus of claim 15 wherein the hollow interior of said step insert force-  
5 fittingly receives and supports a projecting arm forming part of a step for said cast member.

18. The apparatus of claim 15, wherein said flange portion comprises first and second  
10 covering portions for respectively sealing said first and second openings.

19. The apparatus of claim 15 wherein said elongated openings are formed in a blank which  
15 is welded into an opening in said one mold member provided for said blank.

20. The apparatus of claim 15 wherein said step insert member is formed of a plastic  
20 material.

*Sub 2*  
21. An insert adapted to be embedded in a cast member for force-fittingly receiving a leg  
portion of a step, said insert being comprised of :  
25 a hollow, substantially cylindrical-shaped elongated housing having an open end and a closed end;

one of said ends and having a flange lying in a plane diagonally aligned with a  
30 longitudinal axis of said housing;

another one of said ends having a flange lying in a plane perpendicular to said longitudinal axis;

an interior surface of said housing  
35 having a portion thereof being provided with a

0935106-091496  
664760-9075660

plurality arranged at intervals and annular projections extending radially inward;

each projection having tapering cross-section defined by a first surface diagonally aligned with and longitudinal axis and facing the open end and a second surface perpendicular to said closed end.

22. The insert of claim 21, further comprising a plurality of ears integrally joined at the open end of said housing and projecting away from the housing;

said ears being adapted to flex when a force is applied thereto;

each ear having a hooked-shaped configuration and cooperating with a flange adjacent said open end to embrace a marginal portion surrounding an opening in a support member for retaining the insert on the support member.

23. The insert of claim 22 wherein said flange at said another one of said ends covers said opening to prevent seepage therethrough.

24. The insert of claim 21 wherein said housing is provided with a plurality of annular flanges integral with and extending radially outwardly from said housing and spaced along the housing for retaining the insert in place when embedded in a cast member.

25. The insert of claim 21 wherein said closed end has an annular flange integral with said housing and extending radially outward therefrom to seal in opening in a mold core preparatory to

Suba3 insertion of the insert into a cast material.

26. The insert of claim 21 wherein a portion of said housing adjacent to said closed end and said closed end has a thickness which is chosen to provide additional structural strength to withstand forces encountered by said insert when injected into a cast material and also to regulate cycle time.

10

27. In combination, an insert and a reciprocable pin assembly for receiving said insert for insertion into a casting material, said insert comprising:

15 a hollow, substantially cylindrical-shaped, elongated housing having an open end and a closed end;

one of said ends and having a flange lying in a plane diagonally aligned with a longitudinal axis of said housing

20 another one of said ends having a flange lying in a plane perpendicular to said longitudinal axis;

said pin assembly having a first cylindrical-shaped portion of a first diameter;

25 a second cylindrical-shaped portion of a second diameter less than said first diameter, one end of said second portion being integrally joined to one end of said first portion, forming an annular ledge at the juncture thereof; said ledge

30 lying in a plane perpendicular to a longitudinal axis of said pin assembly;

said pin assembly second portion being inserted into said insert through said open end with said open end resting on said ledge;

35

6647 SUB C3



said pin assembly having an integral projection arranged on said ledge and extending along said second portion toward a free end thereof;

5                   said insert having at least one slot extending inwardly from said open end for receiving said projection for aligning said insert on said pin assembly.

10                   28. A method for producing in a mold assembly a cast member having openings for receiving the legs of a step and employing a pin assembly and insert comprising:

15                   (a) providing a pin assembly, said pin assembly having a first cylindrical-shaped portion of a first diameter;

20                   a second cylindrical-shaped portion of a second diameter less than said first diameter one end of said second portion being integrally joined to one end of said first portion, forming an annular ledge at the juncture thereof; said ledge lying in a plane perpendicular to individual axis of said pin assembly; said pin assembly having an integral projection arranged on said ledge and extending along said second portion toward a free end and thereof;

25                   (b) providing an insert having a hollow substantially cylindrical-shaped elongated housing having an open end and a closed end;

30                   one of said ends and having a flange lying in a plane diagonally aligned with a longitudinal axes of said housing

35                   another one of said ends having a flange lying in a plane perpendicular to said longitudinal axis; said insert having at least one slot

extending inwardly from said open end for receiving said projection for aligning said insert on said pin assembly.

(c) placing said insert on said pin assembly second portion by inserting said second portion through the open end of said insert;

(d) sliding the insert onto said second portion until said open end engages said ledge;

(e) rotating said insert on said pin to align said insert so that said slot receives said projection;

(f) projecting said pin assembly through an opening in said mold assembly and into casting material in said mold assembly;

(g) withdrawing said pin assembly from the casting material, whereby said insert remains properly positioned in said casting material.

29. The method of claim 28 wherein step (e) further comprises moving the pin assembly to align the closed end of the insert to lie flush with a wall surrounding the opening in said mold assembly through which the insert and pin assembly is projected, to seal said opening during insertion of the casting material and prior to projection of the pin assembly and insert into the casting material.

30. An insert assembly adapted to be embedded in a cast member for force-fittingly receiving a leg portion of a step, said insert assembly being comprised of:

first and second members adapted to be telescopingly mounted to one another;

said first member being a hollow,

substantially cylindrical-shaped elongated housing  
having first and second open ends and an integral  
annular flange intermediate said first and second  
ends, said flange being diagonally aligned to a  
5 longitudinal axis of said first member;

said first member being slotted on  
opposite sides of said flange to enable said member  
to yield and flex when pressed inwardly;

said second member being a hollow,  
10 substantially cylindrical-shaped elongated housing  
having a first closed end and a second open end;

said open end of said second member  
being telescopingly mounted upon one end of said  
first member, whereby the second member forces the  
15 end of the first member inserted into the open end  
of said second member to flex inwardly, to provide  
a snug force-fit therebetween.

31. The insert assembly of claim 30  
20 wherein said second member is provided with a  
plurality of outwardly extending integral flanges  
arranged at spaced intervals therealong to enhance  
embedment of the second member in a cast member.

32. The insert assembly of claim 30  
25 wherein the closed end of said second member is  
provided with an annular flange lying in a plane  
diagonally aligned with a longitudinal axis of said  
second member.

33. The insert assembly of claim 30  
30 wherein an interior surface of said second member  
has a portion thereof being provided with a  
plurality of annular projections extending radially  
35 inward; and

each projection having tapering cross-section defined by a first surface diagonally aligned with and longitudinal axis and facing the open end and a second surface perpendicular to said closed end.

34. The insert assembly of claim 30 wherein said first member is provided with score areas adjacent one side of said diagonally-aligned flange to facilitate breaking away of the first member from said second member.

35. The insert assembly of claim 30 wherein said first member is provided with a plurality of outwardly directed annular flanges for gripping an interior surface of said second member, the surfaces of said flanges being inclined so that it requires less force to telescopingly mount the second member onto the first member than is required to pull the first and second members apart.

36. The insert assembly of claim 30 wherein said second member is provided with an inwardly directed helical annular flange for gripping an exterior surface of said first member, the surface of said helical flange being inclined so that it requires less force to telescopingly mount the second member onto the first member than is required to pull the first and second members apart, said helical annular flange also serving to form a snug press-fit with a leg of a step member insertable therein.

37. A method for embedding inserts in a

cast member, said inserts being comprised of an assembly of first and second members adapted to be telescopingly mounted to one another;

5 said first member being a hollow, substantially cylindrical-shaped elongated housing having first and second open ends and an integral annular flange intermediate said first and second ends, said flange being diagonally aligned to a longitudinal axis of said first member;

10 said first member being slotted on opposite sides of said flange to enable said member to yield and flex when pressed inwardly;

15 said second member being a hollow, substantially cylindrical-shaped elongated housing having a first closed end and a second open end;

said open end of said second member being capable of being telescopingly mounted upon one end of said first member, said method comprising the steps of:

20 (a) providing a mold assembly including an annular-shaped core member having a pair of openings and a pair of tubular members joined to the core member and each being aligned with one of said openings and extending inwardly from a concave surface of said core member;

25 (b) inserting one end of said first member into a convex surface side of said core member and into one of said step tubes, whereby said step tube urges the inserted end of the first member to flex inwardly and thereby provide a snug force-fit, said first member being pushed into said step tube by a distance sufficient to move said diagonally-aligned flange into engagement with a marginal portion of said core surrounding the opening in said core; and

30

35

(c) telescopingly mounting said second member onto an end of said first member extending outwardly from the convex surface of said core, whereby said second member urges the inserted end of the first member to flex inwardly and thereby provide a snug force-fit therebetween.

38. The method of claim 37 further comprising providing score areas on said first member adjacent to said diagonally-aligned flange to enable the first member to easily break away from said second member when cast material, which is poured into the mold assembly, has set and the cast member is pulled out of the mold.

39. A method for embedding inserts in a cast member, said inserts being comprised of an assembly of first and second members adapted to be telescopingly mounted to one another;

said first member being a hollow, substantially cylindrical-shaped elongated housing having first and second open ends and an integral annular flange intermediate said first and second ends, said flange being diagonally aligned to a longitudinal axis of said first member;

said first member being slotted on opposite sides of said flange to enable said member to yield and flex when pressed inwardly;

said second member being a hollow, substantially cylindrical-shaped elongated housing having a first closed end and a second open end;

said open end of said second member being adapted for being telescopingly mounted upon one end of said first member, said method comprising the steps of:

(a) providing a mold assembly including an annular-shaped core member having a pair of openings and a pair of tubular members joined to the core member and each being aligned with one of  
 5 said openings and extending inwardly from a concave surface of said core member;

(b) telescopingly mounting said second member onto an end of said first member, whereby said second member urges the inserted end of the  
 10 first member to flex inwardly and thereby provide a snug force-fit therebetween; and

(c) inserting another end of said first member into a convex surface side of said core member and into said step tube, whereby said step  
 15 tube urges the inserted end of the first member to flex inwardly and thereby provide a snug force-fit, said first member being pushed into said step tube by a distance sufficient to move said diagonally-aligned flange into engagement with a marginal  
 20 portion of said core surrounding the opening in said core.

40. The method of claim 39 further comprising providing score areas on said first  
 25 member adjacent to said diagonally-aligned flange to enable the first member to easily break away from said second member when cast material, which is poured into the mold assembly, has set and the cast member is pulled out of the mold.

*Add a' →* *Add C5 →*